REMARKS

Reconsideration and allowance in view of the foregoing amendment and the following remarks are respectfully requested.

Claims 1-9 remain pending. Claims 9 stand withdrawn as directed to a non-elected invention.

The Examiner required corrected drawings. Formal drawings correcting the informalities noted by the Examiner are submitted herewith. Approval of the herewith formal drawings is respectfully requested.

Original claim 1-8 were objected to because of noted informalities. Claim 1 has been amended above to correct the informalities noted by the Examiner. Reconsideration and withdrawal of this rejection is requested.

Original Claims 1, 3 and 7 were rejected under 35 USC 102(b) as anticipated by Oshima (USP 5,347,193). Applicant respectfully traverses this rejection.

Anticipation under Section 102 of the Patent Act requires that a prior art reference disclose every claim element of the claimed invention. See, e.g., Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1574 (Fed. Cir. 1986). While other references may be used to interpret an allegedly anticipating reference, anticipation must be found in a single reference. See, e.g., Studiengesellschaft Kohle, G.m.b.H. v. Dart Indus., Inc., 726 F.2d 724, 726-27 (Fed. Cir. 1984). The absence of any element of the claim from the cited reference negates anticipation. See, e.g., Structural Rubber Prods. Co. v. Park Rubber Co., 749 F.2d 707, 715 (Fed. Cir. 1984). Anticipation is not shown even if the differences between the claims and the prior art reference are insubstantial and the missing elements could be supplied by the knowledge of one skilled in the art. See, e.g., Structural Rubber Prods., 749 F.2d at 716-17.

The Examiner quotes several passages of Oshima as allegedly anticipating the elements of applicant's independent claim 1. It is respectfully noted, however, that claim 1 specifically requires that the spark plug comprise "a fused junction layer between said earth electrode and said chip including components of said chip and said earth electrode". In this regard, in an embodiment of the invention, as illustrated in Figure 4, the fused junction layer 47 between the earth electrode 41 and the chip 45 includes components of chip 45 and earth electrode 41. Furthermore, the spark plug defined by applicant's claim 1 details the dimensional relationship for the earth electrode, that a cross-sectional area of the chip at a tip thereof on the opposite side of the fused junction layer is not less than 0.12 mm^2 and not more than 1.15 mm^2 and a length from the end surface to a top surface of the tip is not less than 0.3 mm and not more than 1.5 mm.

While it is noted that the Examiner has asserted that Oshima discloses in Figure 4 dimensions relationships of A, B, C, D, E, and F, it is respectfully submitted that these dimensional relationships of Oshima are for the central electrode 4, as shown in Figures 1 and 4 of Oshima. Therefore, Oshima also fails to anticipate or render obvious the dimensional relationship for the earth electrode as defined by applicant's claim 1.

Furthermore, the Examiner has said "Oshima further yet discloses 'the incidence energy of the laser welding to the front end surface 41a of the nickel-alloyed metal, which decreases the formation of the welding portion 5a (Ir-Ni alloyed layer 5A) so as to lose the firmness between the outer surface 51a of the tip 5 and the inner surface 43a of the recess 43' (column 5, lines 2-7)". However, the quoted description is directed to the welding for the central electrode. Therefore, Oshima fails to anticipate or render obvious the feature of the claimed invention that the fused junction layer has substantially a conical outer surface continuously connecting a peripheral outer surface of the chip to the end surface of the earth electrode with a radius on a sectional plane along an axis of the chip.

In prior art spark plugs having the noble metal firing chip on the central electrode, the chips are fixed with practically sufficient strength. On the other hand, noble metallic firing chips on the earth electrodes are conventionally fixed with practically insufficient strength. This is due to the difference in the fixing location. More specifically, when a noble metallic firing chip on the central electrode is fixed near the body of the spark plug, the thermal stress at the fused junction layer connecting the noble metallic firing chip to the central electrode is relatively low. In contrast, when an noble metallic firing chip is fixed on the earth electrode, it is remote from the body of the spark plug. In other words, the fused junction layer connecting the noble metal chip to the earth electrode is more exposed to the combustion chamber. Accordingly, the fused junction layer on the earth electrode is subject to relatively high thermal stress. This may result in the development of cracks and may ultimately result in disconnecting of the noble metallic chip from the earth electrode.

The spark plug defined by applicant's claim 1 addresses this problem in the connection between the noble metallic chip and the earth electrode. It is respectfully submitted that the structure claimed, directed to a noble metal chip welded to an earth electrode so as to withstand thermal stress, is not only different from but is in no way anticipated by nor made obvious from a noble metal chip welded to a central electrode. It is therefore respectfully submitted that the invention of claim 1 is not anticipated by nor obvious from Oshima.

With respect to claim 7, applicant's claim 7 specifies that the fused junction layer includes the component of the chip of not less than 35% by weight and nor more than 80% by weight. Oshima does not anticipate nor render obvious this characteristic of the invention either. It is therefore respectfully submitted that the spark plug defined by applicant's claim 7 is not antiquated by nor obvious from Oshima.

Claim 2 was rejected under 35 USC 103(a) as being unpatentable over Oshima. Applicant respectfully traverses this rejection.

In order to prove obviousness, a challenger must present prior art references which disclose the claimed subject matter of the patent/application in question. If separate prior art references each disclose separate elements of a claim, the challenger must also show some teaching, suggestion, or incentive in the prior art that would have led one of ordinary skill in the art to make the claimed combination. See, e.g., Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n.24, 304-05 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986). In determining obviousness, there must be some reason other than hindsight for selectively combining the prior art references to render the claimed invention obvious. See, e.g., Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143 (Fed. Cir. 1985).

Claim 2 is submitted to be patentable over Oshima for the reasons advanced above. It is further respectfully submitted that Oshima does not anticipate nor render obvious the subject matter of applicants' dependent claim 2.

In this regard, the Examiner admits that Oshima fails to disclose the feature that the radius of the fused junction satisfies the condition $D/4 \leq R \leq 3D/4$. The Examiner's summary conclusion that it would have been "obvious" to modify Oshima in this regard and/or that the claimed relation is an obvious matter of design choice is respectfully traversed. The claimed feature provides the notable advantageous effect, as shown by a comparison of Figure 8a to the structure shown in Figure 7, having the fused layer but having other dimensions. Thus, applicant has clearly established that the dimension claimed is not a mere obvious matter of design choice but rather has substantial advantages over other dimensions. The Examiner has neither established a *prima facie* case of obviousness based on Oshima nor established that the relationship claimed was a known choice to the skilled artisan at the time applicants' invention was made.

It is clear that the initial burden of establishing a basis for denying patentability to a claimed invention rests upon the Examiner. In re Piasecki, 745 F. 2d 1468, 223

U.S.P.Q. 785 (Fed Cir. 1984). In establishing a *prima facie* case of obviousness under 35 U.S.C. § 103, it is incumbent upon the Examiner to provide a reason why one of ordinary skill in the art would have been led to arrive at the claimed invention from the prior art. Ex part Clapp, 227 U.S.P.Q. 972 (BPAI 1985). To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from applicant's disclosure. See, for example, Uniroyal, Inc. v. Rudkin-Wiley Corp. 837 F.2d, 7 U.S.P.Q.2d 1434 (Fed. Cir. 1988).

Because none of the references of record discloses the details of the claimed invention lacking in the primary reference, nor the unique advantages thereof, there can be no suggestion to modify the structure to contain those features. See In re Civitello, 339 F.2d 243, 144 USPQ 10, (CCPA 1964).

For the reasons advanced above, reconsideration and withdrawal of the rejection of claim 2 is requested.

Claim 4 was rejected under 35 USC 103 as unpatentable over Oshima in view of Matsutani. Applicant respectfully traverses this rejection. Claim 4 is submitted to be patentable over Oshima for the reasons advanced above. The Examiner's further reliance on Matsutani does not overcome the deficiencies of Oshima noted above. It is therefore respectfully submitted that claim 4 is also allowable over this prior art combination.

Claims 5, 6 and 8 were rejected under 35 USC 103(a) as unpatentable over Oshima in view of Toya. Applicant respectfully traverses this rejection.

These claims are submitted to be patentable over Oshima for the reasons advanced above. The Examiner's further reliance on Toya does not overcome the deficiencies of the primary reference noted above. Furthermore, it is respectfully noted that claim 8 recites the further feature that the fused junction layer includes the

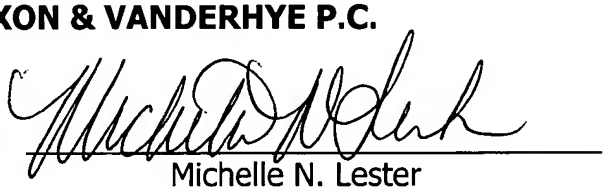
component of the chip of not less than 35% by weight and not more than 80% by weight. Both Oshima and Toya fail to anticipate nor render obvious the claimed range.

In view of the foregoing, reconsideration and withdrawal of the rejection of claims 5, 6, and 8 is requested.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and an early Notice to that effect is earnestly solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

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